At many eastern stations the clouds passed over, reducing ceiling, but not horizontal visibility. In the Dust Bowl visibility was often reduced to zero at the height of the storms, schools were closed, flying schedules canceled, and railway and highway traffic seriously impeded. Near Kingsdown, Kans., on the 25th, a train was delayed several hours while the crew shoveled a dustdrift from the track. Immeasurable damage was done to growing wheat and other crops by the flying sand, and over large areas grass on the southwestern ranges was covered with dust and made unfit for cattle.

Widespread, moderate to substantial rains or snows near the end of the month greatly alleviated, though only temporarily, the dusty conditions over much of the Plains area and the Southwest, leaving those sections in a more promising situation than for many months.

April brought decidedly more than normal precipitation to most eastern and northeastern States, and to limited portions of the northern Great Plains and the far Northwest, but a large western area, reaching from the Plains States westward to the Pacific Coast, received less than normal. Deficiencies were greatest in the southern Great Plains and the Southwest, with totals for the month ranging from 19 percent of normal in Arizona to 32 in Texas and up to 96 percent in Wyoming.

As a result of continued dryness, duststorms were again frequent, and dense dust was reported during the month from Texas and New Mexico northward to Montana and the Dakotas and from Colorado eastward to the Mississippi Valley, while light dust was noted from the Rocky Mountains eastward to the Atlantic Coast. The number of days on which dusty conditions were reported varied widely at different stations, ranging from, one at Hampton Roads, Va., to as many as 19 in portions of Kansas, while in New Mexico strong winds prevailed throughout the month, and local duststorms occurred in some sections of the State every day. At several Lake Region stations, chiefly in Wisconsin and Michigan, the presence of dust in the atmosphere was shown by deposits of mud following showers.

Dense dust was most frequent during the latter half of the month and the dusty conditions in the Atlantic area obtained near the close of April. Visibility during the storms ranged from zero to several miles; in numerous instances it was reduced to less than one mile for several hours—at Havre, Montana, zero visibility on the 13th lasted only 2 minutes, while at Amarillo, Texas, on the 23d the duration was 2 hours. On the 6–8th strong northwest winds in New Mexico caused one of the most severe duststorms of the season; dust on the 6th was confined to the extreme northeast corner of the State, but on the 7–8th it covered all sections between the Rio Grande River and the Colorado State line eastward and southward to Texas. Much damage was done to wheat and other crops in the central portion of this area. On the 28th visibility in northeastern New Mexico was reduced to 25 feet.

In South Dakota duststorms were more numerous than usual and were reported from all sections during the month, especially in the western portion; they were most damaging from the 24th to the 26th. In western Kansas duststorms were especially severe on the 2, 7, 11, 12, 14, 16, 17, 22, 24, and 25th, though all parts of that section were not affected on each of these days. In the southwestern counties the air was more or less filled with dust on from 15 to 19 days of the month and wheat was severely damaged. In Colorado a storm on the 27th made driving extremely dangerous and all air transportation was grounded due to poor visibility. Choun,[1] describing the duststorms in Colorado during the month, says that the storm on the 27th, which covered practically the entire State, was comparable in severity to any during the past 2 years. Travel was hazardous and automobiles were damaged by blowing sand; radio equipment in airplanes was rendered useless and many planes made forced landings due to this cause. A transport plane made a forced landing at Sterling, Colo., after 1,000 automobiles and some fire-fighting apparatus responded to an emergency alarm and lighted the airport with their headlights. The dustfall at Fort Collins, Colo., was estimated at 420 tons per square mile.

[1] H. F. Choun, Climatological Data, Colorado Section, April 1937.

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[RICHMOND T. ZOCH, *in Charge of Library*]

By AMY D. PUTNAM

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SOLAR OBSERVATIONS

SOLAR OBSERVATIONS DURING APRIL 1937

By IRVING F. HAND, Assistant in Solar Radiation Investigations

For a description of instruments employed and their exposures, the reader is referred to the January 1935 REVIEW, page 24.

Table 1 shows that solar radiation intensities averaged above normal during April at Washington, Madison, and Blue Hill. The intensities at Lincoln averaged below normal, chiefly because of dust storms. On the afternoon of the 14th, although there were no condensed water-vapor clouds present, dust depleted radiation receipt to such a degree that the values at Lincoln are considerably less than 10 percent of those taken a week later. Observations taken through dust when other clouds are not present are included in the mean values because this is the simplest manner of determining the effect of dust storms in absorbing, scattering, and reflecting radiation from the sun and sky.